West Nile Virus Surveillance Summary
Kentucky 2002

Introduction

The Kentucky Department for Public Health (KDPH), as the lead agency, prepared for the 2002 surveillance of West Nile virus through cooperative initiatives with the Kentucky Department of Agriculture (KDA) and the Kentucky Department of Fish and Wildlife Resources (KDFWR). The KDPH granted a contract to the University of Kentucky Livestock Disease Diagnostic Center (UKLDDC) for West Nile virus testing of wild birds, mosquito pools and equines. The KDPH Division of Laboratory Services (DLS) provided IgM capture Elisa testing on human specimens with confirmation provided by the Centers for Disease Control and Prevention (CDC) Arboviral Laboratory. By the close of the year West Nile virus activity had been documented in 90% of Kentucky's counties in either birds, horses, humans or mosquito pools.

Human Surveillance

Information on the human West Nile virus meningitis/encephalitis case definition and submission of samples was sent electronically to hospital infection control professionals and to health department surveillance personnel. The Public Health web site provided a fact sheet and weekly updates on West Nile virus.

Local health department or KDPH surveillance personnel initiated a case history investigation on all West Nile positive specimens reported by the DLS. Positive laboratory results received from commercial laboratories were also investigated and the request was made to these laboratories to forward the samples on to DLS. Samples testing positive by Elisa IgM capture antigen testing at the DLS were reported as probable cases until confirmation was received from CDC. Cases were divided by clinical history into two groups, West Nile encephalitis/meningitis or West Nile Fever. West Nile encephalitis is reportable by regulation. West Nile Fever is a milder form of clinical disease with no neurological manifestations. It is not reportable by regulation, but the CDC's National Electronic Telecommunication Surveillance System (NETSS) did provide a code for this disease and all confirmed cases in Kentucky were transmitted to CDC along with the confirmed cases of West Nile encephalitis.

Seventy-five patients met the clinical definition and laboratory criteria for either West Nile Encephalitis or West Nile Fever. Fifty-three persons or 70.6% of the cases were cases of West Nile Encephalitis. The average age in this group was 59 years, with 68% being over the age of 50 years. The youngest case was a 7 year old and the oldest a 91 year old person. Fifty-five percent of the cases were male. There were five deaths in this group with an average age of 74 years in those that died. The week of August 18 through the 24th, Morbidity and Mortality Weekly Report (MMWR) week 34, was the peak onset week. Cases were reported in 10 of the 15 Kentucky Area Development Districts (ADD).

Twenty-two persons were diagnosed with West Nile Fever and most did not require hospitalization. The mean age in this group was 55 years and the ages ranged

from 28 to 87 years. The peak onset week was again week 34. There were no deaths in this group. West Nile fever cases occurred in seven different Kentucky ADDs.

Map 1 shows the incidence by county for all 75 cases reported in Kentucky and Chart 1 shows the onset dates by MMWR week for all 75 cases.

Map 1

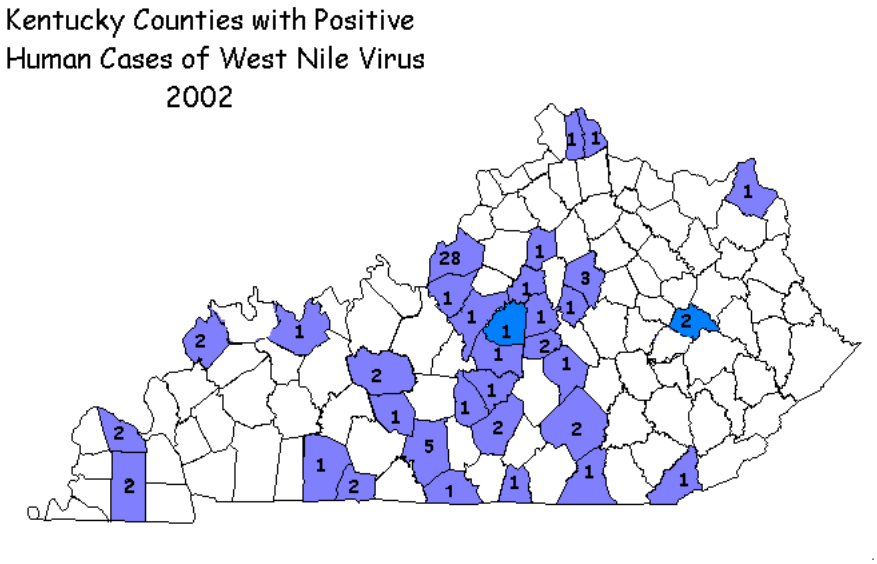
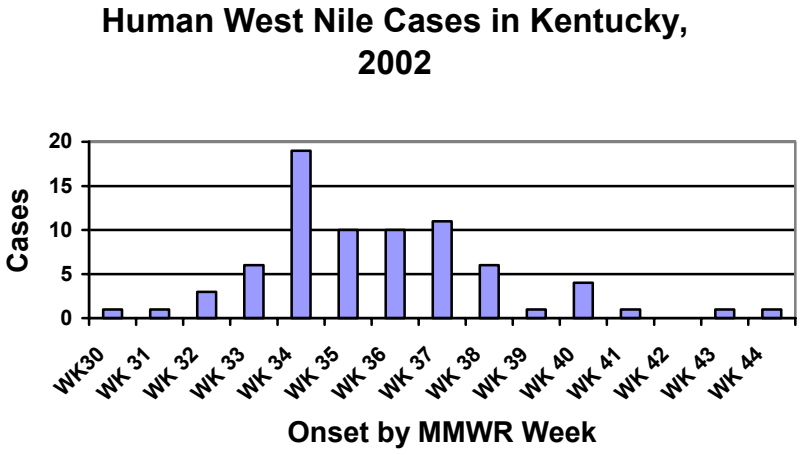


Chart 1



Bird Surveillance

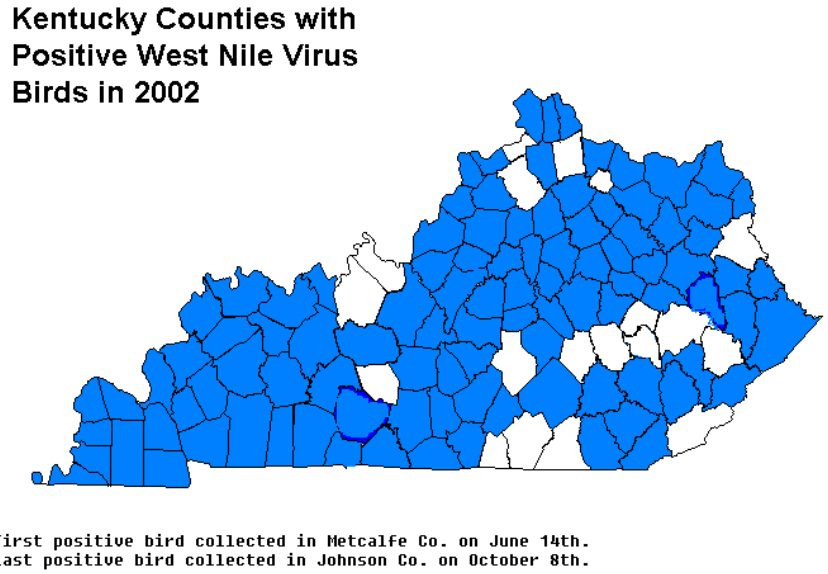
The KDPH and KDFWR worked together to provide each county with a pre-paid shipping container to submit dead birds to the UKLDDC for West Nile testing. They

jointly designed a reporting form and the KDFWR's toll free number was utilized once again for dead bird reporting. The public was encouraged to report dead birds and to submit birds to the local health department environmental section for shipment to the laboratory. Information was available on the Public Health web site about dead bird reporting and submission.

Initially the dead bird surveillance was to start in July, 2002, but as other states began reporting cases of West Nile virus in birds at an earlier than expected date the KDPH requested local health departments to submit any suspect cases beginning in June. Testing was done by polymerase chain reaction (PCR) testing on tissues from the birds at the UKLDDC.

Two thousand, six hundred, and eighty-five (2,685) birds were reported and of those 1,597 were submitted for testing from 115 of the 120 Kentucky counties. There were 693 birds positive for West Nile virus from 101 counties. The first positive bird was collected on June 14, 2002 in Metcalfe County and the last positive bird was collected on October 8, 2002 from Johnson County. A steep increase in positive birds was noticed the first week of August and 77.5% of the positive birds were collected between August 4th and August 31st. Because of the rapid influx of specimens and a limitation on testing resources the KDPH requested that counties stop submitting birds once positive activity had been determined for their area. Forty-one species of birds tested positive with the three most prevalent being, blue jays (24.7%), house sparrows (18.6%) and American crows (14%). Birds remain the most important sentinel species to provide information on the earliest activity of the virus in a given locality. MMWR week 32, August 4th through the 10th was the peak week for positive birds.

Map 2



Mosquito Surveillance

Fourteen counties (plus Marshall Co. through the Tennessee Valley Authority office) participated in mosquito sampling for West Nile virus surveillance in 2002. New counties included Fulton, Daviess, Union, Metcalfe, Kenton, Grant and Perry counties. Warren, Jefferson, Fayette, Boone, Campbell, and Rowan counties continued their surveillance effort from last year. The number of sites varied in each county but at each site one CDC light trap and one gravid trap was used. Trapping was done once a week and started the week of June 25 and lasted through October 16. Approximately 25,000 mosquitoes were collected in 2002 representing 36 different species, up from last year's total of 5,000 mosquitoes and 25 species. The mosquitoes were shipped to the UKLDDC where the KDPH's environmental biologist speciated the collections and separated each species into separate testing groups or pools. The mosquitoes were tested by PCR in pools of no more than 50 per species per county. Fifty-five (55) positive pools were collected from nine counties in 2002 (see Table1). The positive pools peaked the week of August 18 and all positives were urban *Culex* species.

Table 1

County	Number of Pos. pools
Boone Co.	6
Campbell Co.	3
Daviess Co.	2
Fayette Co.	19
Fulton Co.	1
Jefferson Co.	19
Marshall Co.	2
McCracken Co.	1
Warren Co.	2

Equine Surveillance

Kentucky Department of Agriculture personnel investigated equine cases with positive West Nile virus findings or with reported neurological disease. The KDA provided the KDPH with results on positive equines as to county of residence and onset date. The West Nile surveillance group entered this data into the Arbonet system. Five hundred and thirteen (513) equine were found to be positive from 78 of the 120 counties in Kentucky (Map 3). Eighty-six percent of the positive horses were unvaccinated and only 23% of those receiving vaccine were vaccinated according to the manufacturer's recommendations. The UKLDDC provided PCR results on tissue samples from necropsied horses and tested serum and cerebrospinal fluid samples with the IgM capture Elisa for West Nile virus. The Breathitt Veterinary Center at Murray State University submitted samples to the National Veterinary Services Laboratory (NVSL) in Ames, Iowa for IgM testing.

The peak week of onset for equines was MMWR week 36, September 1st through the 7th, two weeks following the peak onset for humans.

Map 3 Kentucky Counties with Positive West Nile Virus Cases in Equines--2002

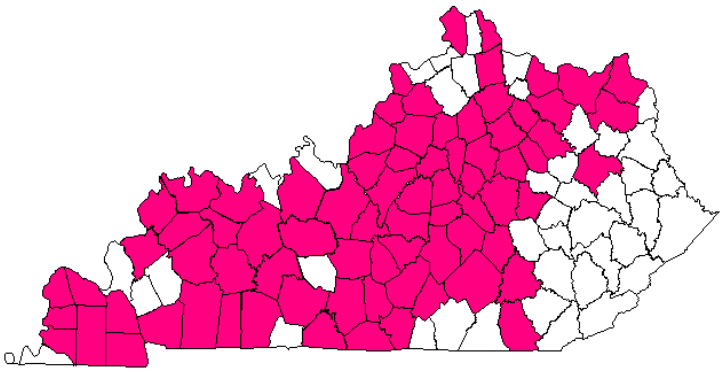
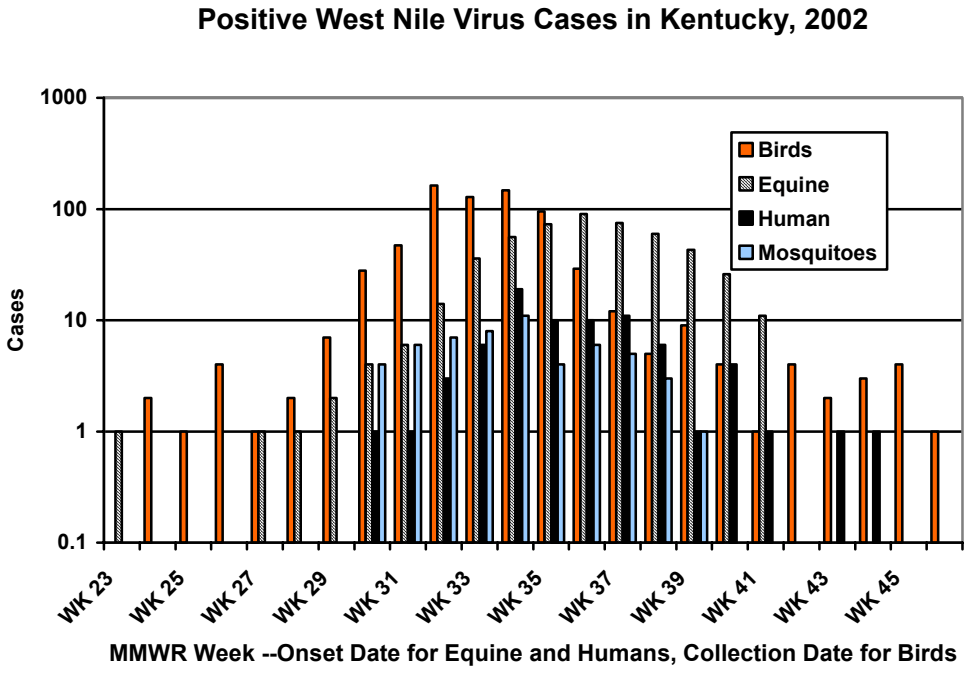


Chart 2 presents the onset date for illness in humans and equines along with the collection date for positive birds and mosquito pools by MMWR week.

Chart 2



Positive birds peaked in week 32, humans and mosquito pools in week 34 and equine in week 36. Detecting positive birds provides the earliest evidence of viral activity.

For additional information on West Nile virus data contact either Dr. Sue Billings or Catherine Mahl in the KDPH Division of Epidemiology and Health Planning, 502-564-3418. The map of Kentucky counties with West Nile Virus activity in 2002, and the County West Nile Virus Chart, listing the positives by species for each county, may be found on the Public Health web site in the data warehouse section.

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